United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Shale 5-9" Wind River Basin Precipitation Zone

Site ID: R032XY254WY

Major Land Resource Area: 32 – Northern Intermountain Desertic Basins

Physiographic Features

This site occurs on moderate to steep slopes and ridge tops.

Landform: Hillsides, ridges & escarpments **Aspect:** N/A

	Minimum	Maximum
Elevation (feet):	4500	6600
Slope (percent):	0	60
Water Table Depth (inches):	None within 60 inches	
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	0	0
Frequency:	None	None
Duration:	None	None
Runoff Class:	negligible	high

Climatic Features

Annual precipitation ranges from 5-9 inches per year. The normal precipitation pattern shows peaks in May and June and a secondary peak in September. This amounts to about 50% of the mean annual precipitation. Much of the moisture that falls in the latter part of the summer is lost by evaporation and much of the moisture that falls during the winter is lost by sublimation. Average snowfall is about 20 inches annually. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.

Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

High winds are generally blocked from the basin by high mountains, but can occur in conjunction with an occasional thunderstorm.

Growth of native cool-season plants begins about April 1 and continues to about July 1. Cool weather and moisture in September may produce some green up of cool season plants that will continue to late October.

The following information is from the "Pavillion" climate station:

	Minimum	Maximum	5 yrs. out of 10 between
Frost-free period (days):	95	175	May 19 – September 19
Freeze-free period (days):	98	185	May 6 – October 3
Mean Annual Precipitation (inches):	2.50	12.54	

Mean annual precipitation: 7.85 inches
Mean annual air temperature: 44.53°F (30.5°F Avg. Min. to 58.5°F Avg. Max.)
For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at http://www.wcc.nrcs.usda.gov/ website. Other climate station(s) representative of this precipitation zone include" Riverton", "Arminto", and "Lost Cabin".

Influencing Water Features

Wetland Description:	System	Subsystem	Class	Sub-class
None	None	None	None	None

Stream Type: None

Representative Soil Features

The soils of this site are very shallow (less than 10 inches to bedrock) well-drained soils formed from residuum. These soils have rapid to slow permeability and can be of any texture but are typically heavy textured. This site usually occurs on steep slopes with many outcrops of shale bedrock. These clay shales are usually saline or alkaline in various degrees and normally produce sparse stands of halophytes and saline tolerant grasses. The soil characteristics having the most influence on the plant community are the very shallow soils (which drastically reduces the amount of available moisture) and the potential high quantities of soluble salts.

Major Soil Series correlated to this site include:

Other Soil Series in MLRA 32 correlated to this site include:

Parent Material Kind: residuum
Parent Material Origin: shale
Surface Texture: clay loam, loam, silt loam, silty clay loam, clay
Surface Texture Modifier: none
Subsurface Texture Group: clay loam, fine loamy, clayey
Surface Fragments ≤ 3" (% Cover): 0 to 10
Surface Fragments > 3" (%Cover): 0 to 10
Subsurface Fragments ≤ 3" (% Volume): 5 to 20
Subsurface Fragments > 3" (% Volume): 0

	Minimum	Maximum
Drainage Class:	well	well

Permeability Class:	slow	moderate
Depth (inches):	2	10
Electrical Conductivity (mmhos/cm) ≤20":	4	16
Sodium Absorption Ratio ≤20":	0	13
Soil Reaction (1:1 Water) ≤20":	6.6	8.4
Soil Reaction (0.1M CaCl2) ≤20":	NA	NA
Available Water Capacity (inches) ≤30":	0.6	2
Calcium Carbonate Equivalent (percent) ≤20":	0	5

Plant Communities

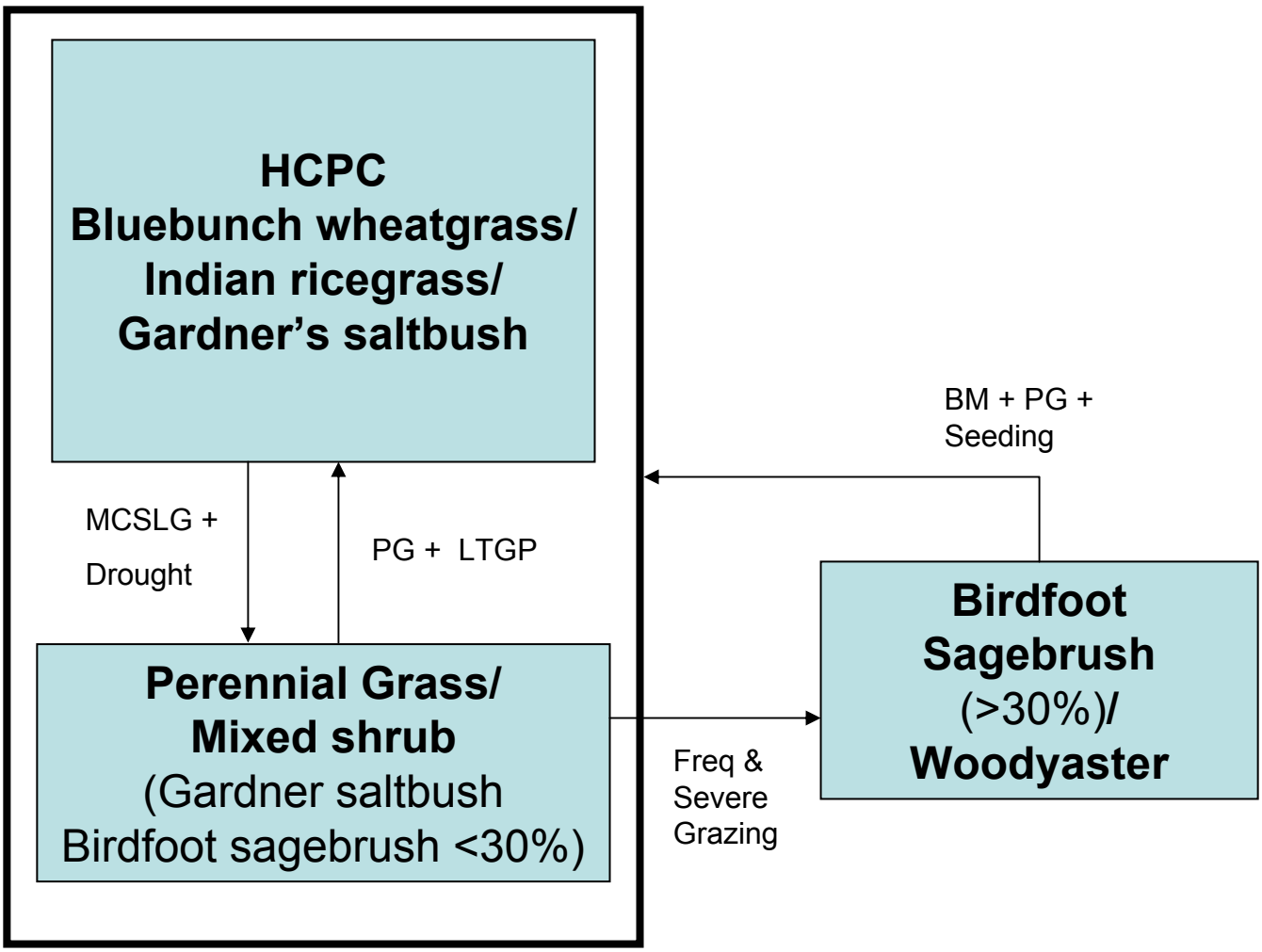
Ecological Dynamics of the Site:

Potential vegetation on this site is dominated by salt tolerant plants and drought resistant mid cool-season perennial grasses. The expected potential composition for this site is about 60% grasses, 15% forbs and 25% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

As this site deteriorates, species such as short warm-season grasses, birdfoot sagebrush and woodyaster will increase. Weedy annuals will invade. Cool season grasses such as bluebunch wheatgrass, Indian ricegrass and western wheatgrass will decrease in frequency and production.

The Historic Climax Plant Community (description follows the plant community diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.



BM - Brush Management (fire, chemical, mechanical)
Freq. & Severe Grazing - Frequent and Severe Utilization of the Cool-season Mid-grasses during the Growing Season
GLMT - Grazing Land Mechanical Treatment
LTPG - Long-term Prescribed Grazing
MCSLG - Moderate, Continuous Season-long Grazing
NU, NF - No Use and No Fire
PG - Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season)
VLTPG - Very Long-term Prescribed Grazing (could possibly take generations)
WF - Wildfire

Plant Community Composition and Group Annual Production

Reference Plant Community (HCPC)

COMMON NAME/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Annual Production (Normal Year) Total: 100		
			Group	lbs./acre	% Comp.
GRASSES AND GRASS-LIKES					
GRASSES/GRASSLIKES					
Griffiths wheatgrass or	Elymus albicans	ELAL7	1	15 - 25	15 - 25
Bluebunch wheatgrass	Pseudoroegneria spicata	PSSP6			
Western wheatgrass	Pascopyrum smithii	PASM	2	5 - 10	5 - 10
Indian ricegrass	Achnatherum hymenoides	ACHY	3	10 - 20	10 - 20
Bottlebrush squirreltail	Elymus elymoides	ELELE	4	5 - 15	5 - 15
MISC. GRASSES/GRASSLIKES			**5**	**5 - 15**	**5 - 15**
Alkali sacaton	Sporobolus airoides	SPAI	5	0 - 5	0 - 5
Sandberg bluegrass	Poa secunda	POSE	5	0 - 5	0 - 5
Blue grama	Bouteloua gracilis	BOGR2	5	0 - 5	0 - 5
other perennial grasses (native)		2GP	5	0 - 5	0 - 5
FORBS			**6**	**10 - 20**	**10 - 20**
Woollypod milkvetch	Astragalus purshii	ASPU9	6	0 - 5	0 - 5
Smooth woodyaster	Xylorhiza glabruiscula	XUGL	6	0 - 5	0 - 5
Western aster	Symphyotrichum ascendens	SYAS3	6	0 - 5	0 - 5
Desert princesplume	Stanleya pinnata	STPI	6	0 - 5	0 - 5
Fineleaf hymenopappus	Hymenopappus filifolius	HYFI	6	0 - 5	0 - 5
Douglas' dustymaiden	Chaenactis douglasii	CHDO	6	0 - 5	0 - 5
Desert wirelettuce	Stephanomeria runcinata	STRU3	6	0 - 5	0 - 5
Narrowleaf wirelettuce	Stephanomeria minor var. minor	STMIM	6	0 - 5	0 - 5
Stemless mock goldenweed	Stenotus acaulis acaulis	STACA	6	0 - 5	0 - 5
Thrift mock goldenweed	Stenotus armerioides armerioides	STARA	6	0 - 5	0 - 5
Curly dock	Rumex crispus	RUCR	6	0 - 5	0 - 5
Hood's phlox	Phlox hoodii	PHHO	6	0 - 5	0 - 5
Cous biscuitroot	Lomatium cous	LOCO4	6	0 - 5	0 - 5
Sulphur flower buckwheat	Eriogonum umbellatum	ERUM	6	0 - 5	0 - 5
Fewflower buckwheat	Eriogonum pauciflorum	ERPA9	6	0 - 5	0 - 5
Fringed sagewort	Artemisia frigida	ARFR4	6	0 - 5	0 - 5
Plains pricklypear cactus	Opuntia polyacantha	OPPO	6	0 - 5	0 - 5
other perennial forbs (native)		2FP	6	0 - 5	0 - 5
TREES/SHRUBS					
Gardner's saltbush	Atriplex gardneri	ATGA	7	5 - 15	5 - 15
Winterfat	Krascheninnikovia lanata	KRAL2	8	0 - 5	0 - 5
MISC. SHRUBS			**9**	**10 - 20**	**10 - 20**
Wyoming big sagebrush	Artemisia tridentata wyomingensis	ARTRW8	9	0 - 5	0 - 5
Birdfoot sagebrush	Artemisia pedatifida	ARPE6	9	0 - 5	0 - 5
Shadscale	Atriplex confertifolia	ATCO	9	0 - 5	0 - 5
Rubber rabbitbrush	Ericameria nauseosa	ERNA10	9	0 - 5	0 - 5
Green rabbitbrush	Chrysothamnus viscidiflorus	CHVI8	9	0 - 5	0 - 5
Skunkbush sumac	Rhus trilobata	RHTR	9	0 - 5	0 - 5
other shrubs & half shrubs (native)		2SHRUB	9	0 - 5	0 - 5

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors.

Plant Community Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Bluebunch Wheatgrass/Indian Ricegrass/Gardner's Saltbush Plant Community

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores and droughty soils due to the shallow depth to undeveloped salty weathered shale material. Historically, fire has not had an important role in this site due to the naturally sparse vegetation, which prohibits the spread of fire. Potential vegetation is about 60% grasses, 15% forbs, and 25% woody plants. Cool season midgrasses dominate the state.

The major grasses include bluebunch wheatgrass, Indian ricegrass, bottlebrush squirreltail, and rhizomatous wheatgrasses. Other grasses occurring on the state include alkali sacaton, blue grama, and Sandberg bluegrass. Gardner's saltbush and winterfat are conspicuous elements of this state. A variety of forbs also occurs in this state and plant diversity is high (see Plant Composition Table).

The total annual production (air-dry weight) of this state is about 100 pounds per acre, but it can range from about 50 lbs./acre in unfavorable years to about 200 lbs./acre in above average years.

The following is the growth curve of this plant community expected during a normal year:
Growth curve number:
Growth curve name:
Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	50	25	5	0	10	0	0	0

(Monthly percentages of total annual growth)

The state is fragile and adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for some drought resistance. This is a sustainable plant community, but is difficult to reestablish when damaged. (Site/soil stability, watershed function, and biologic integrity).

Transitions or pathways leading to other plant communities are as follows:

- Moderate, Continuous Season-Long grazing will convert this plant community to the *Perennial Grass/Mixed Shrub Plant Community.* Prolonged Drought will exacerbate this transition.

Perennial Grass/Mixed Shrub Plant Community

Historically, this plant community evolved under grazing and a low fire frequency. Currently, it is found under moderate, season-long grazing by livestock and will be exacerbated by prolonged drought conditions. This plant community is still dominated by cool-season midgrasses, while short warm-season grasses and miscellaneous forbs account for the balance of the understory.

A variety of shrubs makes up the overstory.

Dominant grasses include bluebunch wheatgrass, bottlebrush squirreltail, and rhizomatous wheatgrasses. Grasses of secondary importance include Sandberg bluegrass, blue grama, and alkali sacaton. Forbs commonly found in this plant community include smooth woodyaster, stemless mock goldenweed, Hood's phlox, sulfur flower buckwheat, Cous biscuitroot, and scarlet globemallow. Shrubs such as Gardner's saltbush, winterfat, birdfoot sagebrush, shadscale saltbush, and big sagebrush account for 20% to 30% of the total production. Plains pricklypear can also occur.

When compared to the Historical Climax Plant Community, birdfoot sagebrush and smooth woody aster have increased. Indian ricegrass and bluebunch wheatgrass have decreased as the production of cool-season grasses has been reduced. Indian ricegrass may occur in only trace amounts under the sagebrush canopy or within the patches of pricklypear. Blue grama has increased, as has plains pricklypear cactus, which occurs only in small patches. In addition, the amount of winterfat may or may not have changed depending on the season of use.

The total annual production (air-dry weight) of this state is about 70 pounds per acre, but it can range from about 25 lbs./acre in unfavorable years to about 150 lbs./acre in above average years.

The following is the growth curve expected during a normal year:
Growth curve number:
Growth curve name:
Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	50	25	5	0	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. The herbaceous component is mostly intact and plant vigor and replacement capabilities are sufficient. Water flow patterns and litter movement may be occurring but only on steeper slopes. Incidence of pedestalling is minimal. Soils are mostly stable and the surface shows minimum soil loss. The watershed is functioning and the biotic community is intact.

Transitional pathways leading to other plant communities are as follows:

- Prescribed grazing or possibly long-term prescribed grazing, will convert this plant community to the *HCPC*. The probability of this occurring is high especially if rotational grazing along with short deferred grazing is implemented as part of a prescribed method of use.

- Frequent and severe grazing over the long-term will convert this plant community to the *Birdfoot Sagebrush/Woodyaster vegetative state.*

Birdfoot Sagebrush/Woodyaster Ground Plant Community
This vegetation state currently is found under heavy, season-long grazing by livestock in the absence of fire. Birdfoot sagebrush and smooth woodyaster are significant components of this plant community. Other plants which may be of importance include skunkbush sumac, shadscale saltbush, big sagebrush, and green rabbitbrush. Rocky Mountain juniper and black sagebrush can be present but usually occurs only at the upper end of the precipitation zone. Cool-season grasses have been reduced. Bare ground, warm season grasses, and annual plants are also prominent.

The dominant grasses are blue grama and threadleaf sedge. Cool-season grasses have been eliminated or significantly reduced. Weedy annual species such as cheatgrass and Russian thistle may occur if a seed source is available. Cactus often increases. Noxious weeds such as Russian knapweed may invade the site if a seed source is available. Birdfoot sagebrush is a significant component of this plant community.

The interspaces between plants have expanded significantly leaving the amount of bare ground more prevalent. As a result, the herbaceous production has been significantly reduced. When compared with the Perennial Grass/Mixed Shrub Plant Community, the total annual production does not differ significantly, as the shrub production off sets the decline in the herbaceous production. The shift in production will affect the type and availability forage.

The total annual production (air-dry weight) of this state is about 50 pounds per acre, but it can range from about 15 lbs./acre in unfavorable years to about 150 lbs./acre in above average years.

The following is the growth curve expected during a normal year:
Growth curve number:
Growth curve name:
Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	50	25	5	0	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change. Continued frequent and severe grazing or the removal of grazing does not seem to affect the composition or structure of the plant community. Plant diversity is moderate to poor. The plant vigor is diminished and replacement capabilities are limited due to the reduced number of cool-season grasses. Plant litter is noticeably less when compared to the HCPC.

Soil erosion is accelerated because of increased bare ground. Water flow patterns and pedestalling are obvious. Infiltration is reduced and runoff is increased. Rill channels may be noticeable in the interspaces and gullies may be establishing where rills have concentrated down slope.

Transitional pathways leading to other plant communities are as follows:

- Brush management and prescribed grazing will return this state to near *Historic Climax Plant Community*. Seeding native perennials may be necessary to hasten establishment of these species.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Historic Climax Plant Community: The predominance of grasses in this plant community favors grazers and mixed-feeders, such as bison, elk, and antelope. Suitable thermal and escape cover for deer may be limited due to the low quantities of woody plants. However, topographical variations could provide some escape cover. When found adjacent to sagebrush dominated states, this plant community may provide brood rearing/foraging areas for sage grouse, as well as lek sites. Other birds that would frequent this plant community include western meadowlarks, horned larks, and golden eagles. Many grassland obligate small mammals would occur here.

Perennial Grass/Mixed Shrub: The combination of a shrub overstory and an understory of grasses and forbs provide a diverse plant community for wildlife. This diversity provides important winter ranges, so mule deer and antelope may use this state for foraging year-round, as would cottontail and jack rabbits.

Birdfoot Sagebrush/Woodyaster: This plant community can provide winter foraging for mule deer and antelope, as brush can approach 15% protein and 40-60% digestibility during that time.
Due to the sparseness of the vegetation, this community does not provide escape and thermal cover for large ungulates or for nesting habitat for sage grouse.

Animal Preferences (Quarterly - 1,2,3,4) for commonly occuring plants in MLRA 32XY, 5-9 inch Wind River Basin

COMMON NAME/ GROUP NAME	SCIENTIFIC NAME	SCIENTIFIC SYMBOL	*Cattle*	*Sheep*	*Horses*	*Mule Deer*	*Antelope*
GRASSES/GRASSLIKES							
alkali bluegrass	Poa secunda ssp. juncifolia	POSEJ	DDDD	PPPP	DDDD	PPPP	PPPP
alkali cordgrass	Spartina gracilis	SPGR	DDDD	UUUU	DDDD	UUUU	UUUU
alkali sacaton	Sporobolus airoides	SPAI	PPPP	DDDD	PPPP	DDDD	DDDD
American mannagrass	Glyceria grandis	GLGR	DDDD	UUUU	DDDD	UUUU	UUUU
American sloughgrass	Beckmannia syzigachne	BESY	DDDD	UUUU	DDDD	UUUU	UUUU
Baltic rush	Juncus balticus	JUBA	DDDD	UUUU	DDDD	UUUU	UUUU
basin wildrye	Leymus cinereus	LECI4	PPPP	PPPP	PPPP	DDDD	DDDD
beaked sedge	Carex rostrata	CARO6	DDDD	UUUU	DDDD	UUUU	UUUU
bearded wheatgrass	Elymus caninus	ELCA	PPPP	DDDD	PPPP	DDDD	DDDD
big bluegrass	Poa ampla (syn. to Poa secunda)	POAM (POSE)	PPPP	PPPP	PPPP	PPPP	PPPP
blue grama	Bouteloua gracilis	BOGR2	DDDD	DDDD	DDDD	DDDD	DDDD
bluebunch wheatgrass	Pseudoroegneria spicata	PSSP6	PPPP	PPPP	PPPP	DDDD	DDDD
bottlebrush squirreltail	Elymus elymoides	ELELE	DDDD	DDDD	DDDD	UUUU	UUUU
bulrush	Scirpus spp.	SCIRP	DDDD	UUUU	DDDD	UUUU	UUUU
Canada wildrye	Elymus canadensis	ELCA4	PPPP	PPPP	PPPP	DDDD	DDDD
Fendler threeawn	Aristida purpurea longiseta	ARPUL	UUUU	UUUU	UUUU	UUUU	UUUU
Indian ricegrass	Achnatherum hymenoides	ACHY	PPPP	PPPP	PPPP	PPPP	PPPP
inland saltgrass	Distichlis spicata	DISP	UUUU	UUUU	UUUU	UUUU	UUUU
little bluestem	Schizachyrium scoparium	SCSC	PPPP	PPPP	PPPP	DDDD	DDDD
mat muhly	Muhlenbergia richardsonis	MURI	UUUU	UUUU	UUUU	UUUU	UUUU
Nebraska sedge	Carex nebrascensis	CANE2	PPPP	PPPP	PPPP	DDDD	DDDD
needleandthread	Hesperostipa comata	HECO26	PPPP	PPPP	PPPP	PPPP	PPPP
northern reedgrass	Calamagrostis stricta	CAST13	PPPP	DDDD	PPPP	UUUU	UUUU
Nuttall's alkaligrass	Puccinellia nuttaliana	PUNU2	PPPP	PPPP	PPPP	PPPP	PPPP
plains reedgrass	Calamagrostis montanensis	CAMO	DDDD	DDDD	DDDD	DDDD	DDDD
prairie cordgrass	Spartina pectinata	SPPE	PPPP	DDDD	PPPP	UUUU	UUUU
prairie junegrass	Koeleria macrantha	KOMA	DDDD	DDDD	DDDD	DDDD	DDDD
prairie sandreed	Calamovilfa longifolia	CALO	PPPP	DDDD	PPPP	UUUU	UUUU
reed canarygrass	Phalaris arundinacea	PHAR3	DDDD	UUUU	DDDD	UUUU	UUUU
rush	Juncus spp.	JUNCU	DDDD	UUUU	DDDD	UUUU	UUUU
sand dropseed	Sporobolus cryptandrus	SPCR	DDDD	DDDD	DDDD	UUUU	UUUU
Sandberg bluegrass	Poa secunda	POSE	DDDD	DDDD	DDDD	DDDD	DDDD
slender wheatgrass	Elymus trachycaulus	ELTR7	PPPP	DDDD	PPPP	DDDD	DDDD
spike sedge	Carex nardina	CANA2	DDDD	DDDD	DDDD	UUUU	UUUU
thickspike wheatgrass	Elymus lanceolatus	ELLAL	DDDD	DDDD	DDDD	DDDD	DDDD
threadleaf sedge	Carex filifolia	CAFI	DDDD	DDDD	DDDD	DDDD	PPPP
tufted hairgrass	Deschampsia caespitosa	DECA18	PPPP	PPPP	PPPP	DDDD	DDDD
water sedge	Carex aquatilis	CAAQ	DDDD	UUUU	DDDD	UUUU	UUUU
western wheatgrass	Pascopyrum smithii	PASM	DDDD	DDDD	DDDD	DDDD	DDDD
FORBS							
American licorice	Glycyrrhiza lepidota	GLLE3	UUUU	UUUU	UUUU	UUUU	UUUU
American vetch	Vicia americana	VIAM	PPPP	PPPP	PPPP	PPPP	PPPP
arrowgrass	Triglochin spp.	TRIGL	T	T	T	T	T
asters	Aster spp.	ASTER	UUUU	UUUU	UUUU	UUUU	UUUU
badlands mule-ears	Wyethia scabra	WYSC	UUUU	UUUU	UUUU	UUUU	UUUU
beaked skeletonweed	Shinnersoseris rostrata	SHRO2	UUUU	UUUU	UUUU	UUUU	UUUU
biscuitroots	Lomatium spp.	LOMAT	DDDD	DDDD	UUUU	DDDD	DDDD
blue-eyed grass	Sisyrinchium spp.	SISYR	DDDD	PPPP	DDDD	DDDD	DDDD
breadroot scurfpea	Pediomelum esculentum	PEES	DDDD	DDDD	DDDD	DDDD	DDDD
buttecandle	Cryptantha celosiodes	CRCE	UUUU	UUUU	UUUU	UUUU	UUUU
cattail, broad-leaf	Typha latifolia	TYLA	DDDD	UUUU	DDDD	UUUU	UUUU
cattail, narrow-leaf	Typha angustifolia	TYAN	DDDD	UUUU	DDDD	UUUU	UUUU
desert princesplume	Stanleya pinnata	STPIP	T	T	T	T	T
Douglas' dustymaiden	Chaenactis douglasii	CHDO	UUUU	UUUU	UUUU	UUUU	UUUU
fleabane	Erigeron spp.	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
foothills deathcamas	Zigadenus paniculatus	ZIPA2	T	T	T	T	T
fringed sagewort	Artemisia frigida	ARFR4	UUUU	UUUU	UUUU	UUUU	UUUU
green sagewort	Artemisia dracunculus	ARDR4	UUUU	UUUU	UUUU	UUUU	UUUU
hawksbeard	Crepis acuminata	CRAC2	UUUU	PPPP	UUUU	DDDD	DDDD
horsetails	Equisetum spp.	EQUIS	UUUU	UUUU	UUUU	UUUU	UUUU
Indian paintbrush	Castilleja spp.	CASTI2	DDDD	DDDD	DDDD	DDDD	DDDD
iris	Iris spp.	IRIS	UUUU	UUUU	UUUU	UUUU	UUUU
larkspur	Delphinium spp.	DELPH	DDDD	DDDD	DDDD	DDDD	DDDD
licorice-root	Ligusticum spp.	LIGUS	UUUU	UUUU	UUUU	UUUU	UUUU
lupine	Lupinus spp.	LUPIN	DDDD	T	DDDD	DDDD	DDDD
milkvetch	Astragalus spp.	ASTRA	DDDD	DDDD	DDDD	DDDD	DDDD
miner's candle	Cryptantha virgata	CRVI4	UUUU	UUUU	UUUU	UUUU	UUUU
mustard	Brassica spp.	BRASS2	UUUU	UUUU	UUUU	UUUU	UUUU
nailwort	Paronychia spp.	PARON	UUUU	UUUU	UUUU	UUUU	UUUU
Nuttalll's povertyweed	Monolepis nuttalliana	MONU	UUUU	UUUU	UUUU	UUUU	UUUU
penstemon	Penstemon spp.	PENST	PPPP	PPPP	PPPP	PPPP	PPPP
phlox	Phlox spp.	PHLOX	UUUU	UUUU	UUUU	UUUU	UUUU
plains springparsley	Cymopterus acaulis	CYAC	UUUU	DDDD	UUUU	UUUU	UUUU
poison hemlock	Conium maculatum	COMA2	T	T	T	T	T
prairie bluebells	Mertensia lanceolata	MELA3	DDDD	PPPP	DDDD	DDDD	DDDD
Pursh seepweed	Suaeda calceoliformis	SUCA2	UUUU	UUUU	UUUU	UUUU	UUUU
rosy pussytoes	Antennaria rosea	ANRO2	UUUU	UUUU	UUUU	UUUU	UUUU
sandwort	Arenaria spp.	ARENA	UUUU	UUUU	UUUU	UUUU	UUUU
silverweed cinquefoil	Argentina anserina	ARAN7	UUUU	UUUU	UUUU	UUUU	UUUU
stemless goldenweed	Haplopappus acaulis	HAAC	UUUU	UUUU	UUUU	UUUU	UUUU
sulphur flower buckwheat	Eriogonum umbellatum	ERUM	UUUU	UUUU	UUUU	UUUU	UUUU
tufted evening-primrose	Oenothera caespitosa	OECA10	UUUU	UUUU	UUUU	UUUU	UUUU
twogrooved milkvetch	Astragalus bisulcatus	ASBI2	T	T	T	T	T
water hemlocks	Cicuta spp.	CICUT	T	T	T	T	T
western buttercup	Ranunculus occidentalis	ROAOC	DDDD	DDDD	DDDD	DDDD	DDDD
western dock	Rumex aquaticus	RUAQ	UUUU	UUUU	UUUU	UUUU	UUUU
western yarrow	Achillea lanulosa	ACHIL	UUUU	UUUU	UUUU	UUUU	UUUU
wild onion	Allium textile	ALTE	DDDD	DDDD	DDDD	DDDD	DDDD
woodyaster	Xylorhiza spp.	XYLOR	T	T	T	T	T
woolly plantain	Plantago patagonica	PLPA2	UUUU	UUUU	UUUU	UUUU	UUUU

TREES, SHRUBS & HALF-SHRUBS							
big sagebrush	Artemisia tridentata	ARTR2	UUUU	DDDD	UUUU	DDDD	DDDD
birdfoot sagebrush	Artemisia pedatifida	ARPE6	UUUU	UUUU	UUUU	UUUU	UUUU
black greasewood	Sarcobatus vermiculatus	SAVE4	DDDD	DDDD	UUUU	DDDD	DDDD
black sagebrush	Artemisia nova	ARNO4	DDDD	PPPP	UUUU	PPPP	PPPP
broom snakeweed	Gutierrezia sarothrae	GUSA2	UUUU	UUUU	UUUU	UUUU	UUUU
bud sagebrush	Picrothamnus desertorum	PIDE4	PPPP	PPPP	DDDD	PPPP	PPPP
fourwing saltbush	Atriplex canescens	ATCA2	PPPP	PPPP	PPPP	PPPP	PPPP
Gardners saltbush	Atriplex gardneri	ATGA	PPPP	PPPP	DDDD	PPPP	PPPP
green rabbitbrush	Chrysothamnus viscidiflorous	CHVI8	DDDD	DDDD	DDDD	DDDD	DDDD
plains cottonwood (sprouts)	Populous deltoides	PODEM	DDDD	DDDD	DDDD	DDDD	DDDD
Rocky Mountain juniper	Juniperus scopulorum	JUSC2	UUUU	UUUU	UUUU	DDDD	UUUU
rubber rabbitbrush	Ericameria nauseosa	ERNA10	UUUU	DDDD	UUUU	DDDD	DDDD
shadscale saltbush	Atriplex confertifolia	ATCO	UUUU	UUUU	UUUU	UUUU	UUUU
shortspine horsebrush	Tetradymia spinosa	TESP2	UUUU	UUUU	UUUU	UUUU	UUUU
silver sagebrush	Artemisia cana	ARCAC5	DDDD	DDDD	DDDD	PPPP	PPPP
silverberry	Eleagnus commutata	ELCO	UUUU	UUUU	UUUU	DDDD	UUUU
skunkbush sumac	Rhus trilobata	RHTR	DDDD	DDDD	DDDD	DDDD	DDDD
spiny hopsage	Grayia spinosa	GRSP	UUUU	UUUU	UUUU	UUUU	UUUU
Utah juniper	Juniperus osteosperma	JUOS	UUUU	UUUU	UUUU	DDDD	UUUU
wax currant	Ribes cereum	RICE	UUUU	UUUU	UUUU	DDDD	DDDD
western snowberry	Symphoricarpos occidentalis	SYOC	UUUU	UUUU	UUUU	DDDD	UUUU
wildrose	Rosa woodsii var. woodsii	ROWOW	DDDD	DDDD	UUUU	DDDD	DDDD
willows	Salix spp.	SALIX	PPPP	PPPP	DDDD	PPPP	UUUU
winterfat	Krascheninnikovia lanata	KRLA2	PPPP	PPPP	PPPP	PPPP	PPPP
yucca	Yucca glauca	YUGL	DDDD	DDDD	DDDD	DDDD	DDDD

N = not used; U = undesirable; D = desirable; P = preferred; T = toxic

Animal Community – Grazing Interpretations

The following table lists suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using this information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor.

Plant Community	Production (lb./ac)	Carrying Capacity* (AUM/ac)
Historic Climax Plant Community	50-200	.07
Perennial Grass/Mixed Shrub	25-150	.05
Birdfoot Sagebrush/Woodyaster	15-150	.01

* - Continuous, season-long grazing by cattle under average growing conditions.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage for cattle, sheep, or horses. During the dormant period, the forage for livestock use needs to be supplemented with protein because the quality does not meet minimum livestock requirements.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group D. Infiltration ranges from slow to moderate. Runoff potential for this site varies from moderate to very high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short-grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Part 630, NRCS National Engineering Handbook for detailed hydrology information).

Rills and gullies should not typically be present. Water flow patterns may be present but should be barely distinguishable. Pedestals are only slightly present in association with bunchgrasses such as bluebunch wheatgrass. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts are present, but only cover 1-2% of the soil surface.

Recreational Uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products
No appreciable wood products are present on the site.

Other Products
None noted.

Supporting Information

Associated Sites

Very Shallow	032XY276WY
Shallow Clayey	032XY258WY

Similar Sites
() – Shale 10-14" Foothills and Basins East P.Z., 032XY354WY has higher production than the Shale 5-9 WR.

Inventory Data References (narrative)
Information presented here has been derived from NRCS inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Chris Krassin, Range Management Specialist, NRCS and Everet Bainter, Range Management Specialist, NRCS. Other sources used as references include USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, USDI and USDA Interpreting Indicators of Rangeland Health Version 3, and USDA NRCS Soil Surveys from various counties.

Inventory Data References
Ocular field estimations observed by trained personnel.

State Correlation
This site occurs entirely in Wyoming.

Type Locality

Field Offices
Casper, Lander, Riverton, Fort Washakie, Dubois

Relationship to Other Established Classifications

Other References

Site Description Approval

_____ _____

State Range Management Specialist Date